EU4 Yerevan Solar Community

EU4YSC

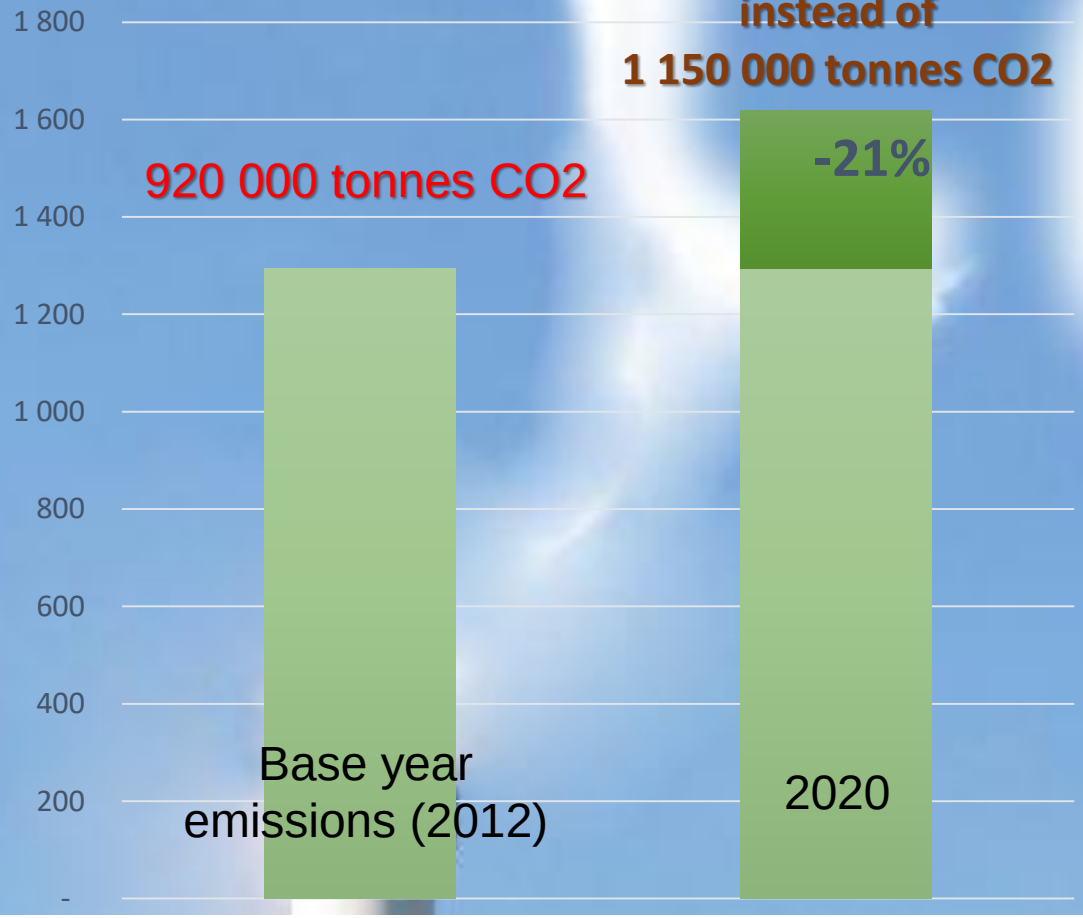
ENPI 2017/393-505

The Covenant of Mayors and Sustainable Energy Action Plan

Covenant of Mayors
Committed to urban sustainable energy

Implementation of the actions can lead to at least **21%** reduction of the GHG emissions

193 202.5 tonnes CO2 instead of 1 150 000 tonnes CO2



WATER SUPPLY

STREET LIGHTING

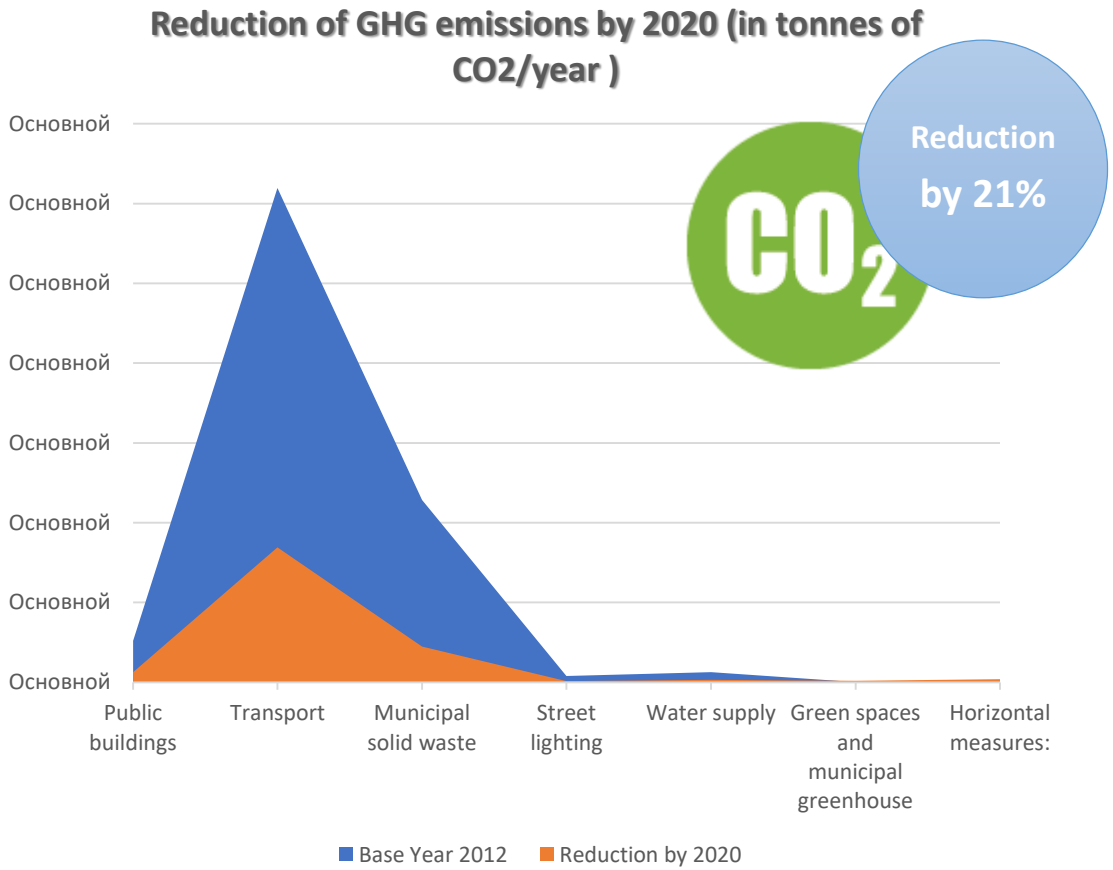
MUNICIPAL SOLID WASTE

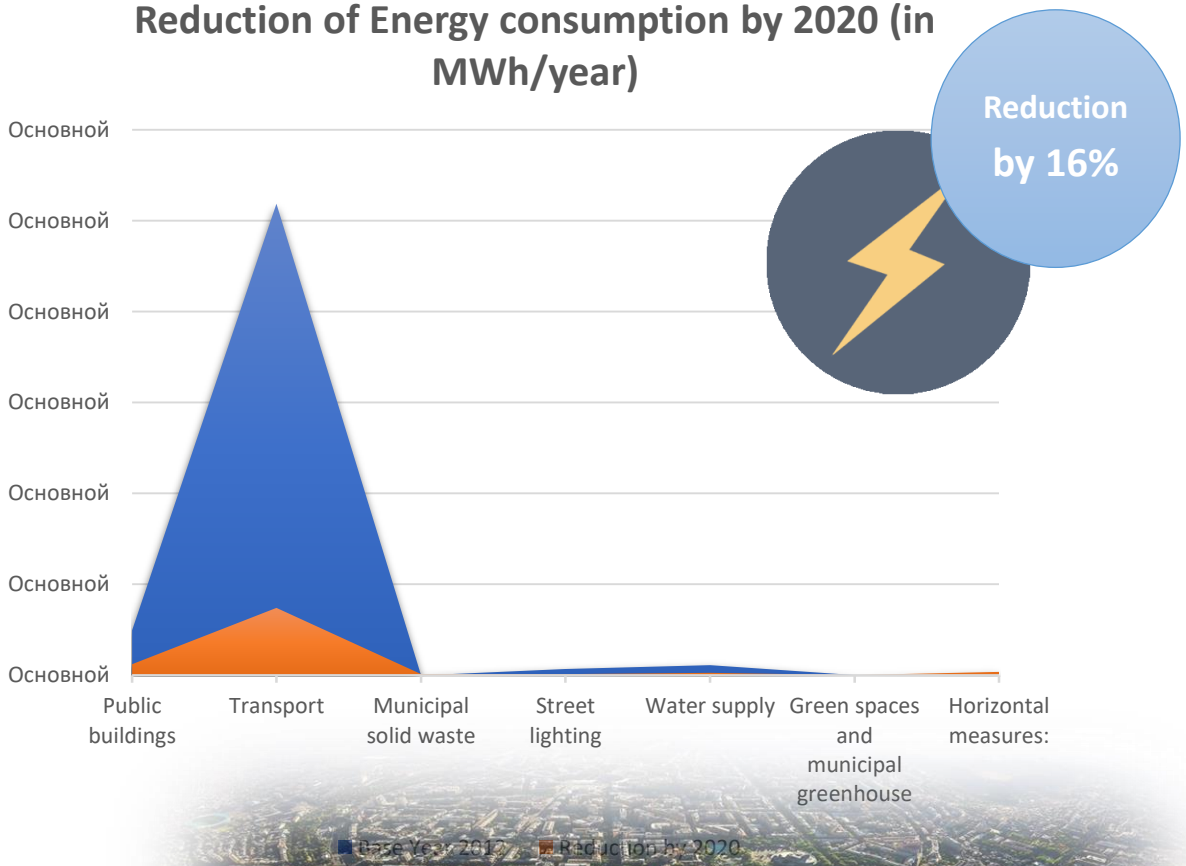
TRANSPORT

PUBLIC BUILDINGS

RESIDENTIAL BUILDINGS

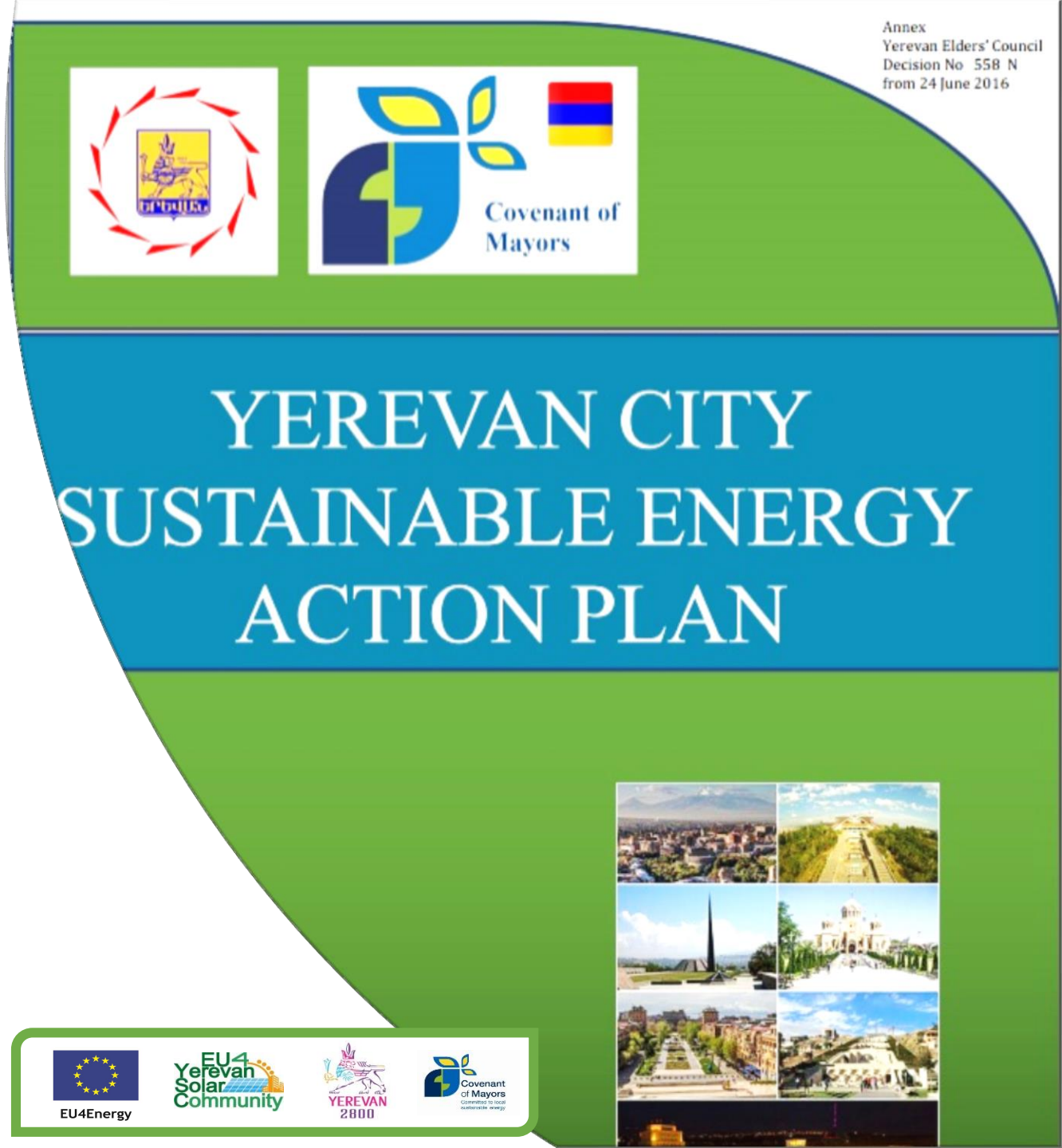
Results anticipated from implementation of the SEAP activities by sectors





Activities from the Yerevan SEAP address in the Proposed Project

- Measure L.3. Installation of photovoltaic luminaries in the lighting systems of yard areas and entrances of multi-apartment buildings
- Measure H.1. Urban energy planning and management
- Measure H.3. Elaboration of energy certificates for buildings.
- Measure H.7 Organizing seminars and training courses for specialists of budget-funded institutions, enterprises and companies
- Measure R.5 Provision of LED lamps for socially vulnerable households
- Measure P.5. Use of renewable energy in municipal buildings
- Measure P.1. Introducing energy managers in municipal institutions



The objective of EU4YSC project

- The objective of this project is to reduce the energy consumption and associated emissions of greenhouse gases (GHGs) through supporting application of energy efficiency measures and renewable energy sources in multi-apartment buildings of Yerevan.

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Project info

- **Duration:** 01/03/2018 – 01/03/2020 (24months)
- **Total Project Budget:** EUR 1,250,004.00
- **EU Contribution:** EUR 1,000,000.00
- **Location:** Yerevan, Republic of Armenia
- **Implementing Partners:** Municipality of Yerevan

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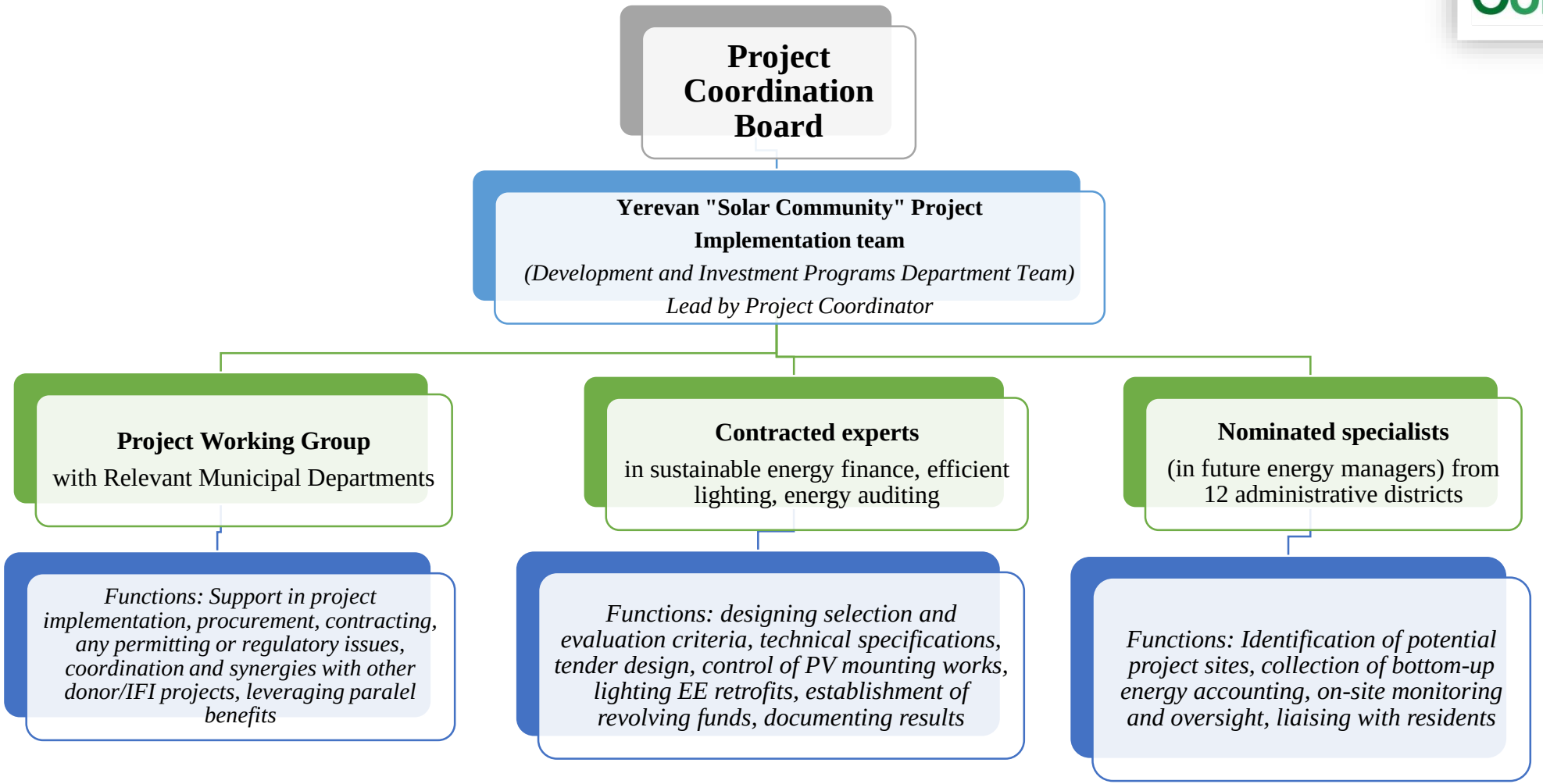
Project Management Structure

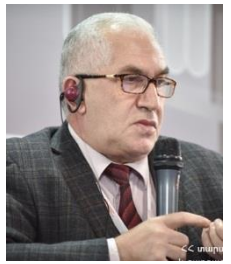


Project Coordination Board Members

Vahe Nikoyan
The Deputy
Mayor of Yerevan

Andrea Baggioli
Programme Manager at Cooperation Section at Delegation of the European Union to Armenia

Jan Waanders
CoM-DEP Support
Team Leader



Ashot Giloyan
Head of Local Government Department of the Ministry of Territorial Administration and Development of Armenia

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Hrayr Antonyan
Head of Communal Service Department of the Municipality of Yerevan

Artem Kharazyan
National Expert Armenia
"Covenant of Mayors East"

Astghine Pasoyan
Executive Director
Foundation to Save Energy

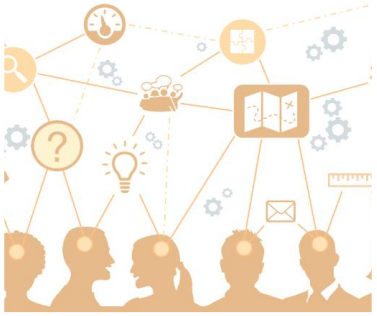
Luiza Vardanyan
Executive Director of Habitat for Humanity Armenia

OBSERVERS

Actions in Brief

Establishment of a model for ensuring 100% use of RE in multi apartment buildings to cover electricity demand for illumination of common spaces and operation of elevators and to transfer elaborated model for enhanced renewable energy use via implementation of pilot actions for proper evaluations to support preparations for scaling up the model.

Setting urban energy planning and management mechanism.



Capacity building activities for condominiums, public and other communities, low-income EE support.

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Targets

90 multi-apartment buildings

In total more than 1MW Solar system

360 outdoor LED lights

1620 indoor LED luminaries

1565 LED bulbs for more than 310 low-income families

Community Revolving Funds

Electronic Energy management software tool

Replicable PPP model

Solar guidebook

More than 5000 families involved

Building selection

- Common elevator-operated building type
- At least 2-entrance
- 9-14 floor
- Seismic resilience
- Flat roof
- Shared courtyard served by the municipally-funded external lighting
- Functional condominium association

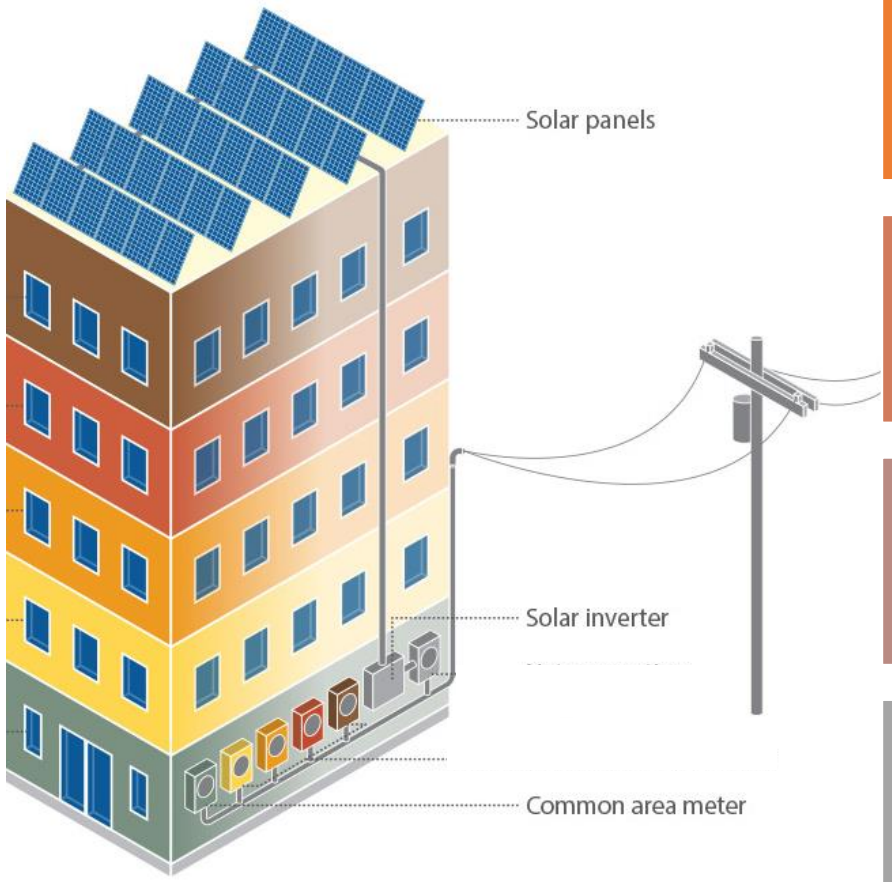
90 multi-apartment buildings

Actions proposed for building selection

77 days

Development of building selection criteria
Elaboration of selection criteria and questionnaire for data collection
Discussion with PCB on selection criteria and questionnaire
Finalization of the questionnaire and selection criteria
Collection of the information
Building Selection
Evaluation of data collected, site visits to potential buildings
Meeting/discussion of PCB and presentation of the results on building selection, approval
Meetings of the building apartment owners on agreement to implement RE and EE measure in their buildings (to be done by condominium reps)
Simple energy audit for selected buildings for elaboration of ToRs for PV systems

Transition to solar-powered renewable energy source



small-scale, autonomous, rooftop distributed solar power generation system

connected to the power grid under acting net-metering scheme

used to store daytime solar electricity output in the grid

and utilize it in evening hours when the common energy-driven services are demanded most

In total more than 1MW Solar syste

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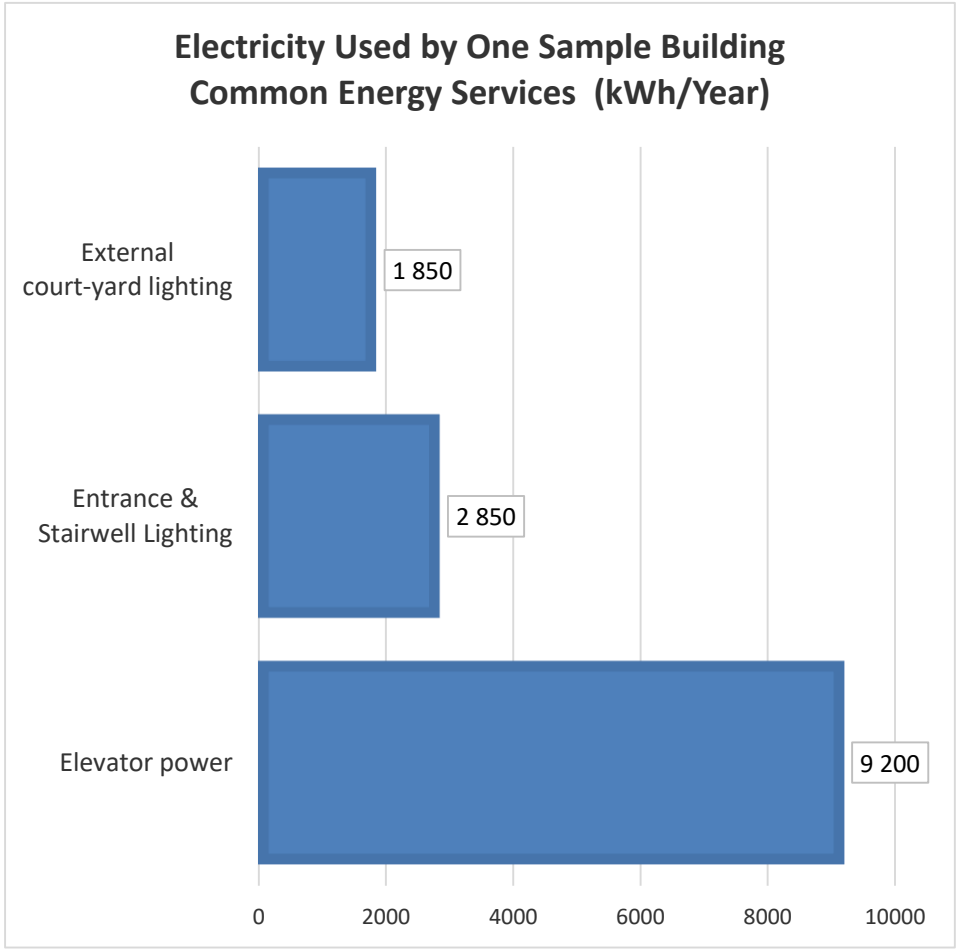
Transition to solar-powered renewable energy source



2 entarance building annually consumes about 13,900 kWh

1 kW installed PV system will generates about 1,500 kWh

Proposed 13.1 KW Solar System will generate 19600 KWh

150 sq. meters needed for each building

Extra income will be accumulated in REVOLVING FUNDS

In total more than 1MW Solar syste

Installation of LED lamps in entrances and outdoor areas

4 outdoor lighting poles with 250W sodium high-pressure lamps

Entrance and staircase incandescent lights

Motion sensors for indoor entrance/stairwell lighting

1620
indoor LED luminaries

360
outdoor LED lights

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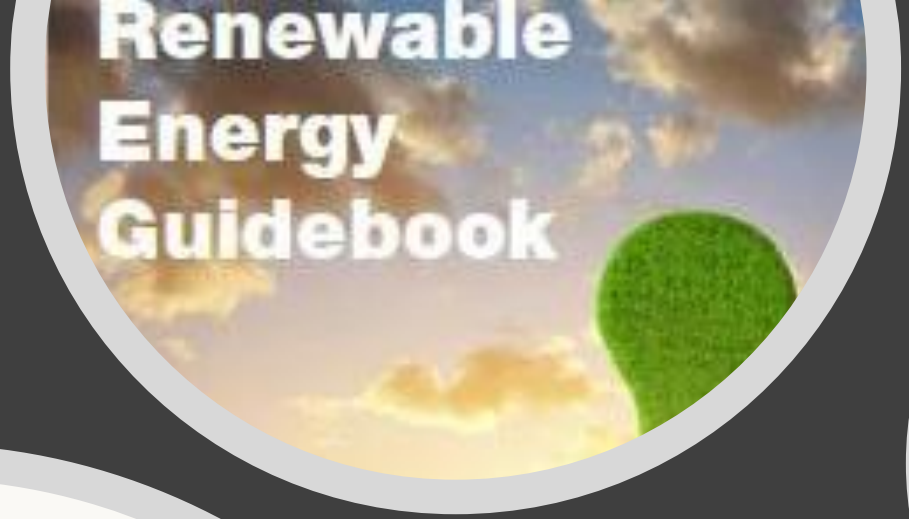
PROJECT IN NUMBERS

	Capital Expenditures	Cumulative Energy Savings (kWh)		Cumulative Financial Benefits (EUR)	
	EUR	Per year	25 years	annually	25 years
Total Capital Expenditures	€ 892,800				
Savings from EE Lighting retrofit		361,412	9,035,310	€ 28,794	€ 719,854
Savings from Transition to Solar Power		886,765	22,169,127	€ 70,649	€ 1,766,242
Surplus solar electricity for Net Metering Sales		881,633	22,040,834	€ 35,120	€ 878,010
Total Benefits		2,129,811	53,245,271	€ 134,564	€ 3,364,107
CO2 reduction (tons)		844	21,100		

IT firm to develop a “smart” database-based software tool, which will allow automating and facilitating the data collection for municipal energy management, and potentially integrate a web-based application. The sought tool should allow for concurrent data entry and access from various users and regular updating of the building energy use database. The added features would allow using the data for benchmarking, trends analysis, and SEAP reporting.

Setting urban energy planning and management office



Capacity building activities for condominiums, public and other communities, low-income EE support

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Social Target

The project will also have social target be addressing the issue of utility affordability for low income families who live in multi-apartment buildings .

1565

LED bulbs for more than **310** low-income families

Replicable PPP model

- This innovative project is intended to design and test a fundamentally new model of promoting renewable energy generation.
- The solution is intended to utilize the EU grant support and Yerevan Municipality's resources to test and scale out a public-private partnership arrangement which will not only rely on the government and donor support, but bring in private players, thus increasing the chances of longer-term success and replication.
- The model has a built in mechanism for sustainable generation of financial revenues which will also ensure the multiplier effect.

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COMPONENTS AND OUTCOMES

1

Component 1: Development of a prototype model of decentralised renewable energy generation and its use in multi-apartment buildings and ultimately promoting zero net energy consumption in multi-apartment buildings operations.

- **Outcomes 1.1 RE retrofit for multi residential building neighbourhood block is created.**
- **Outcomes 1.2 Payment system and Condominium/ Home Owner association revolving fund is created.**

2

Component 2: Setting up Project Performance Monitoring and Reporting and Broader Energy information Management System

- **Outcome 2.1. Energy planning and management systems (and Tool) for the buildings sector in Yerevan established.**
- **Outcome 2.2. Replicable model, investment case for use of solar panels in buildings is elaborated.**
- **Outcome 2.3. Solar guidebook for multi apartment residential buildings and condominium owners.**

3

Component 3: Capacity building activities for condominiums, public and other communities.

- **Outcome 3.1. Information is disseminated through seminars and trainings, and solar guidebook is published and delivered to all the stakeholders for replications.**
- **Outcome 3.2. Low-income Household Lighting Electricity Costs Reduced**

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Overall objective: Impact

Contribute to the implementation of Yerevan 2016 SEAP and 2017 Green City Action Plan targets, as well as to contribute to Armenia's National strategies and plans to increase national energy security

To enhance the share of RES in energy mix	*To improve energy efficiency and reduce total primary energy consumption*	*Contribute to mitigation of climate change.*

Yerevan Municipality *benefits* from having a stronger and financially healthier condominiums, extended building lifetime, reduced city carbon footprint, improved environment

Private Sustainable Energy firm *benefits* from expanding the scope of sold services and market share. These sort of diversified services can be offered to other buildings

Condominium and community members *benefit* from improved energy performance of the building and reduced cost of energy services

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Actions toward sustainable future of the city is our everyday goal.

Thank you!

Tigran Sargsyan

Development and Investment Programs Department

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